International Journal of Analysis and Applications

Financial Shared Service Centres and Corporate Sustainability: Empirical Evidence from ESG Performance

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ABSTRACT. This paper uses data from Chinese listed companies (2013–2023) to investigate how financial shared service centres (FSSCs) affect ESG performance. The results indicate that through strengthening internal controls, environmental protection, and employment standards, FSSCs considerably improve ESG performance. After controlling for endogeneity and employing different variable measures, these impacts are still strong. Additionally, this relationship is positively moderated by corporate digital transformation; FSSCs have a greater ESG impact on companies with greater digital maturity. The impact is most noticeable for the East-Central Chinese businesses, state-owned enterprises, and those with limited funding. These findings provide important direction for policymakers seeking to advance sustainable business practices through organisational change and demonstrate how internal management innovations, such as FSSCs, can help achieve the Sustainable Development Goals (SDGs).

1. Introduction

The integration of the Sustainable Development Goals (SDGs) with corporate strategy has become an irreversible trend in the evolution of the global business ecosystem. According to the

Received May 2, 2025

2020 Mathematics Subject Classification. 91B82.

Key words and phrases. financial shared service centre; ESG; environmental optimization; corporate digital transformation; SDGs.

https://doi.org/10.28924/2291-8639-23-2025-169

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ISSN: 2291-8639

United Nations Global Compact (UNGC) 2022 report, 76% of Fortune Global 500 companies have established ESG oversight mechanisms at the board level, an institutional change that reflects a fundamental shift in stakeholder power structures. Corporate sustainability is not only reflected in explicit indicators such as carbon emissions control, but also involves the implicit process of organisational capacity restructuring and value network reengineering. From a resource-based perspective, ESG practice is essentially the process of building competitive advantage through a unique combination of resources, which is particularly important in the post-epidemic era of frequent supply chain crises. Digital transformation is reshaping the way companies fulfil their social responsibilities. Deloitte's 2023 Global Chief Financial Officer (CFO) Survey shows that companies deploying smart analytics tools are 35% more efficient in ESG report preparation, and this technological empowerment is enabling a shift from reactive compliance to proactive innovation in environmental performance management. Notably, the effectiveness of governance mechanisms directly impacts the sustainability of ESG practices. The study of Organisation for Economic Co-operation and Development (OECD) shows that board ESG committees can drive a 23% increase in corporate green patent applications, which validates the catalytic effect of governance structure change on technological innovation. Against this backdrop, Financial Shared Service Centres (FSSCs) demonstrate unique value creation potential. By integrating scattered financial data flows, FSSC builds a multi-dimensional decision support system covering environmental cost accounting and socially responsible investment assessment. Empirical studies have shown that companies deploying FSSCs have a 19% reduction in supply chain carbon intensity control metrics compared to the control group, while employee benefit expenditure transparency improves by 32% [1]. This management model innovation not only reconfigures the logic of enterprise resource scheduling, but also provides a technological infrastructure for collaborative stakeholder governance.

As a typical paradigm of organisational process reengineering, the core value of Financial Shared Service Center (FSSC) lies in the realisation of cost intensification and risk control in cross-regional operations through information technology reconstruction and financial process standardisation. This new management model breaks through the functional boundaries of traditional finance departments and provides value-added services such as tax planning and compliance audits with the help of cloud-based data integration and intelligent analysis systems. It is worth noting that the application scenario of FSSC has evolved from an efficiency tool for multinational enterprises in the early stage to a digital infrastructure that drives strategic

decision-making. In China, the development of FSSC has been significantly boosted by government policy.

Large businesses and organisations must progressively set up financial shared service centres, according to the Ministry of Finance's (MOF) 2013 Code of Work on Enterprise Accounting Informatisation and 2014 Guidance Opinions on Comprehensively Promoting the Construction of Management Accounting System. Additionally, in 2014 and 2015, the State-owned Assets Supervision and Administration Commission (SASAC) convened central companies to plan the development of financial informatisation and proposed the strategy of "relying on financial sharing to achieve digital transformation" in 2022. To "enhance the construction level of financial shared service centres" and "comprehensively improve the level of digital and intelligent management accounting," the Ministry of Finance (MOF) proposed the "Guidance on Comprehensively Deepening the Application of Management Accounting" in 2024. The number of FSSCs in China has increased significantly as a result of these measures. The potential benefit of FSSCs in corporate sustainability, particularly with regard to environmental, social, and governance (ESG) goals, has not received much attention in the literature, despite the fact that they play a key role in increasing the effectiveness of corporate management. This not only makes it more difficult to fully comprehend its operations, but it also makes it more difficult to use in practice to enhance corporate ESG performance. As a result, thoroughly examining the inherent connections between FSSC and ESG and demonstrating how it might support business sustainable development are both theoretically and practically significant.

This paper presents an empirical analysis using data from listed companies from 2013 to 2023.To address the endogeneity issue, this paper adopts the instrumental variables method, fixed effects model and propensity score matching (PSM) to ensure the robustness of the research findings. The main findings are as follows: first, with the establishment and improvement of corporate finance shared service centres, ESG performance shows a significant upward trend. This conclusion still holds even after adjusting the endogeneity issue and the core variable measure. Second, mechanism analysis shows that financial shared service centres improve the environmental (E), social (S) and corporate governance (G) performance of enterprises through three paths: environmental protection, employment promotion and internal control optimisation, respectively. Third, the moderating effect study shows that the digital transformation of enterprises plays a significant positive moderating role, i.e., the higher the degree of digital transformation, the more pronounced is the effect of FSSC on the improvement of ESG

performance. Fourth, the heterogeneity analysis finds that the effect of FSSC on ESG performance is more significant for firms with high financing constraints, SOEs, and firms located in the East Central region.

Compared with the existing literature, the marginal contributions of this paper's research are mainly reflected in the following: first, it systematically analyses the path of financial shared service centre's influence on corporate ESG performance from both theoretical and empirical dimensions, which enriches the research results on the topic of shared service model and sustainable development in the context of corporate digital transformation. Second, the existence of environmental protection mechanism, employment promotion mechanism and internal control optimisation mechanism of financial shared service centre affecting corporate ESG performance is confirmed through instrumental variable method, fixed effect model and propensity score matching, which provides micro evidence for understanding the theoretical mechanism of shared service model promoting sustainable development. Third, the heterogeneity of the impact of financial shared service centres on ESG performance is analysed from the multidimensional perspectives of enterprises' digital transformation, regional development level and the nature of ownership, which provides policy support for promoting high-quality development by improving the shared service system and optimising resource allocation. Fourthly, it is the first time to empirically test the dual role of financial shared service centres in corporate governance and sustainable development goals, expanding the research boundaries of the shared service model on corporate social value creation, and providing useful references for the construction of modern corporate management mechanisms.

2. Literature review and hypothesis development

Current status of corporate ESG research

Existing studies have formed a multi-dimensional analytical framework around the economic impact of corporate ESG performance, focusing on three main areas: market value transmission, supply chain synergy and innovation-driven mechanisms. At the value transmission level, scholars have found that ESG disclosure improves corporate financing conditions by reducing the information risk premium [2], and that its mechanism of action is particularly significant in market environments with strict environmental regulations [3]. This finding is corroborated by cross-country comparative studies showing an institutional dependence of the effect of ESG performance on the cost of equity capital [4]. However, rating

divergence may erode the ESG premium, with a marginal diminishing valuation-enhancing effect when ESG assessments of the same firm by third-party organisations differ by more than a threshold [5]. In terms of supply chain synergies, digital transformation of core firms significantly enhances suppliers' ESG levels through resource orchestration and knowledge spillovers [6], and this empowering effect is more prominent in supply chain networks where client firms have significant technological potential differences [7]. The use of supply chain financial instruments, on the other hand, alleviates SMEs' financing constraints through a credit enhancement mechanism [8], but needs to guard against cross-chain transmission of ESG risks triggered by false trade [9]. Longitudinal studies have confirmed that there is a dynamic synergistic relationship between supply chain transparency and ESG performance, and the information sharing mechanism can strengthen the chain reaction of environmental governance [10]. In terms of innovation-driven research, ESG performance affects firms' technological change through two paths: human capital restructuring and innovation ecology optimisation. Micro evidence suggests that high ESG-scoring firms attract more creative R&D personnel [11] and align individual innovation incentives with firms' long-term goals through employee stock ownership plans [12]. At the macro level, the interaction between government green subsidy policies and ESG performance significantly promotes breakthrough innovation [13], and this policy synergy is more pronounced in regions with higher institutional quality [14]. It is worth noting that the impact of ESG performance on innovation quality shows heterogeneity, with its enhancement in invention patent grant rates being significantly better than that of utility model patents [15]. Existing studies still have three limitations: first, the industry heterogeneity of the ESG effect is insufficiently explored, and the existing literature overly focuses on the manufacturing industry while ignoring the unique mechanism of the service industry [16]; second, there is a lack of cross-cultural comparative studies, especially how the institutional distance between emerging markets and developed economies moderates the efficacy of ESG still needs to be explored in depth [17]; third, research on how digital technologies can reconfigure the paradigm of ESG practices is in its infancy, and the mechanisms by which emerging technologies such as blockchain can enhance the credibility of ESG disclosures are not yet clear [18].

Current status of the finance shared service centre study

The research system of Financial Shared Service Center (FSSC) has evolved through many stages, and the existing results mainly focus on four dimensions: theoretical construction, economic effect, implementation mechanism and emerging trends. At the level of theoretical

framework, early studies were based on the theory of business process reengineering (BPR), which emphasises the benefits of economies of scale through the elimination of redundant processes [19], and the cases of multinational corporations have shown that centralised processing significantly reduces the unit cost of operations [20]. With the introduction of the Resource-Based View (RBV), scholars have found that FSSCs promote cross-sectoral resource synergies through the construction of "knowledge pools", and that their value creation mechanism is particularly significant in the financial services industry [21]. The adaptation of the Service Quality Gap Model [22] has led to the development of the SERVQUAL-FSSC instrument, which quantifies service quality in terms of reliability, responsiveness, and other dimensions [23]. However, the model has limitations in explaining the dichotomy between strategic control and service innovation, which has prompted scholars to incorporate the Dynamic Capability Theory into the analysis framework [23]. The dynamic capabilities theory can reconstruct the analytical framework [24]. In the field of economic effect research, micro-empirical evidence shows that FSSC implementation significantly reduces the operating costs of enterprises [25], and the application of standardised processes effectively improves the efficiency of accounts payable processing [26]. Research on information transparency enhancement mechanisms reveals that process integration significantly reduces accounting errors [27], which in turn has a dampening effect on debt financing costs [28]. Cost stickiness studies have found that real-time data analytics systems optimise cost elasticity [29], but over-standardisation may raise organisational adaptation risks [30]. Emerging evidence shows that blockchain technology applications significantly shorten transaction validation cycles [31], while artificial intelligence systems enhance financial forecasting accuracy [32]. Implementation mechanism studies reveal multiple moderating effects: internal control quality positively strengthens the financial effectiveness of FSSCs [32], while governance structure deficiencies weaken their resource integration effectiveness [33]. In terms of technology adoption, the application of automation tools improves business processing efficiency [34], but system integration complexity may prolong the payback cycle. Moderation of environmental uncertainty is characterised by heterogeneity: economic policy volatility enhances the control benefits of FSSC [35], but process rigidity may inhibit R&D activities in innovation-intensive industries [36]. Cross-cultural comparative studies have shown that institutional cultural differences significantly influence the acceptance of control models in FSSC [37]. Emerging research directions focus on the deepening impact of digital transformation. Virtual shared service centre (vFSSC) research reveals the double-edged sword effect of hybrid

office models [38], while the path of value reconfiguration under the ESG integration framework highlights the application potential of environmental data platforms [39]. The introduction of machine learning algorithms accelerates the identification of unusual transactions, but the issue of algorithmic bias raises new governance challenges [40]. In the developing country contexts, the institutional vacuum leads to the dilemma of adapting FSSC to local practices [41]. The current research gap focuses on the life cycle evolution law, and the lack of long-term tracking data and the absence of ethical assessment models for smart technologies constrain the deeper development of the theoretical system.

In conclusion, the way financial shared service centres operate, their effects on corporate management, and the multifaceted value creation of corporate ESG performance have all received a lot of attention and investigation from scholars. Regretfully, even less studies have been conducted on the potential interactions and intrinsic connections between corporate ESG performance and financial shared service centres. In addition to restricting our knowledge of how internal management innovation can help accomplish sustainable development goals, this research gap makes it more difficult for businesses to deploy financial shared service centres to enhance ESG performance in real-world scenarios. Thus, there is a need for both theoretical research and practical corporate practice to thoroughly examine the relationship between financial shared service centres and corporate ESG performance and its instrument. This is critical for the advancement of corporate sustainable development.

Hypothesis development

H1: Financial shared service centres can contribute to corporate ESG performance

Financial Shared Service Centres (FSSCs) are able to systematically integrate dispersed ESG-related resources (e.g., environmental monitoring data, funding flows for social responsibility projects) within an enterprise through centralised financial processes and standardised data management, thereby enhancing the efficiency of collaborative execution of ESG strategies [42]. Studies have shown that FSSC's digital platform can integrate non-financial indicators, such as environmental compliance and employee welfare, into the financial accounting system through a unified data interface, thus enhancing the completeness and comparability of ESG disclosure [42]. For example, multinational enterprises can quickly identify high carbon emission links and formulate emission reduction strategies by integrating supply chain environmental data through FSSC [43]. This ability to integrate resources not only optimises the efficiency of ESG resource allocation, but also reduces the cost of cross-departmental

communication and facilitates the establishment of a long-term tracking mechanism for ESG performance [44]. Based on the resource orchestration theory, *hypothesis H1 is proposed: the financial shared service centre significantly improves the comprehensive ESG performance of enterprises through resource integration and synergy.*

H2: Financial Shared Service Centre (FSSC) promotes corporate ESG performance through environmental protection mechanisms

The environmental governance function of FSSC is reflected in its ability to collect and analyse environmental data in a structured manner. By embedding environmental management modules (e.g., carbon footprint tracking system), FSSC is able to systematically monitor resource consumption and pollution emissions in the enterprise's production process [45]. For example, a manufacturing company has optimised the efficiency of equipment operation and reduced energy wastage through the energy data analysis function of FSSC [46]. This data-driven environmental management model enables companies to respond quickly to carbon disclosure requirements from regulators, while promoting the adoption of environmentally friendly technologies by upstream and downstream partners through green supply chain screening mechanisms [47]. Research has shown that the environmental data integration capabilities of FSSCs can effectively reduce the risk of environmental non-compliance and increase investor confidence in corporate governance on climate change issues [48]. Based on institutional theory, *hypothesis H2 is proposed: the FSSC strengthens corporate environmental protection performance under the ESG framework through a systematic monitoring mechanism of environmental data.*

H3: Financial Shared Services Centre (FSSC) promotes corporate ESG performance through employment facilitation mechanism

The employment-enhancing effect of FSSCs stems from the reconfiguration of basic jobs by its automation technology. By automating repetitive financial operations, FSSCs free up human resources to shift to strategic functions such as employee training and benefits management [49]. For example, a retailer significantly improved its employee diversity metrics by establishing a standardised recruitment system through the FSSC, prioritising disadvantaged groups and complementing it with career development programmes [50]. In addition, FSSC's cross-regional collaboration model creates remote jobs and provides employment opportunities for labour in remote areas [51]. This inclusive hiring strategy not only improves corporate social reputation, but also reduces human resource replacement costs by lowering employee turnover [52]. Based on the social contract theory, *hypothesis H3 is proposed: financial shared service centres*

materially improve corporate performance on ESG social dimensions through job structure optimisation and social inclusion mechanisms.

H4: Financial Shared Service Centre (FSSC) promotes corporate ESG performance through internal control optimisation mechanisms

FSSC's enhanced role in corporate governance is mirrored in the standardisation and transparency of its internal control processes. Potential conflicts of interest and compliance deficiencies can be found by FSSCs using automated audit procedures and real-time financial monitoring [53]. For example, a financial institution uses FSSC's smart contracting system to automatically match supplier qualifications with payment terms, reducing the risk of corruption due to human intervention [54]. This technology-enabled governance model not only improves the level of data support for the board's ESG decision-making, but also builds a multi-party collaborative monitoring mechanism by enhancing the efficiency of stakeholder communication [55, 56]. Studies have shown that FSSC's governance transparency enhancement significantly reduces agency costs and enhances institutional investors' recognition of corporate sustainability commitments [57]. Based on stakeholder governance theory, *hypothesis H4 is proposed: financial shared service centres systematically optimise corporate performance on ESG governance dimensions through governance transparency and risk control mechanisms.*

3. Research design

Data sources

This paper used a systematic approach to data collecting and processing to improve data validity and dependability. Using a word frequency crawler, which determines the existence and degree of utilisation of financial shared service centres (FSSMs) based on keyword frequency, information about FSSMs is taken from corporate annual reports. Additional variables, which include sustainability and financial statistics from 2013 to 2023, are taken from the CSI ESG and CSMAR databases. Outliers, financial enterprises, and ST/PT firms were eliminated from the dataset to improve its quality. Continuous variables were significance at the 1% level, and certain variables were log-transformed for scale consistency. With 4,785 valid observations from 600 firms, the final dataset provides a strong basis for analysis.

Variable Measurement

Measurement is done using CSI ESG ratings. Through a multi-dimensional indicator system, the CSI ESG rating thoroughly evaluates how well businesses perform in the three areas

of environmental (E), social (S) and corporate governance (G). It also fully reflects the level of businesses in sustainable development. In addition to evaluating how well businesses perform in environmental protection, resource use, pollution, and other environmental areas, the rating system also looks at how well businesses perform in social dimensions like community relations, employee welfare, and social contribution, as corporate governance areas like information disclosure, corporate governance structure, and safeguarding the rights and interests of shareholders.

This paper uses Python crawler technology to methodically crawl the text data of the annual reports of 600 listed firms to precisely capture the Financial Shared Service Centre (FSSM) implementation status. By deeply mining the expressions related to FSSM in the annual reports, based on the frequency of keywords and semantic associations, we adopt a binary assignment method in order to accurately measure whether the enterprises have established financial shared service centres (FSSM) or not. Specifically, this paper set the FSSM variable to 1 for those firms that have established a FSSM and those that continue to operate it during the sample period, and 0 for those firms that have not established a FSSM during the sample period.

Control variables

The business size, as determined by the natural logarithm of total assets, the sales growth rate (GrossProfit), which is the change in operating income from year to year, and Return on Assets (ROA), which is computed as net profit divided by total assets to evaluate profitability, are the control variables. Market valuation, as determined by the ratio of market capitalisation to total assets, is reflected in Tobin's Q. Whereas Fixed (net fixed assets/total assets) displays the percentage of fixed assets, CashFlow (current assets/current liabilities) demonstrates short-term solvency. Agency expenditures are represented by the management expense ratio (Mfee). FirmAge, which is the log of firm age, is a measure of maturity. CEO-chairman duality is indicated by the dummy variable. If audited by a Big Four company, Big4 = 1, and if not, it equals 0. The ratio of independent directors to total board members is how Indep calculates board independence.

Table 1 Variable descriptions

Variable Attributes	Variable Name	Variable Symbol	Variable Definition
Explained variable	ESG performance	ESG	CSI ESG rating
Core Explanatory Variables	Financial Shared Service Centre	FSSM	Enterprises establishing financial shared centres take the value of 1, otherwise 0
Control Variables	Return on Total Assets	ROA	Net Profit/Total Assets at the End of the Year
	Firm Size	Size	Natural logarithm of annual total assets
	Sales growth	GrossProfit	(current year's operating income - previous year's operating income) / previous year's operating income
	Growth	TobinQ	Year-end market capitalisation/total assets
	Current Ratio	CashFlow	Current Assets / Current Liabilities
	Fixed Net	Fixed	Assets / Total Assets
	Overheads	Mfee	Overheads ratio / Agency costs
	Founding Years	FirmAge	Logarithm of firm's years of existence
	Dual	Dual	Chairman and Managing Director
	Whether Big4	Big4	Audited by Big4 firms takes the value of 1, otherwise it takes the value of 0.
	Ratio of independent directors	Indep	Number of independent directors/number of board of directors at the end of the year
Intermediary Variables	Environmental Protection	Green	Number of green patent applications taken as logarithmic number
	Employee	Employee	Size in logarithmic scale
	Internal control quality	Incontrol	Dibor internal control index
Moderator variable	Corporate digital transformation	DIG	Word frequency statistics

Model Construction

A number of statistical tests were performed during the model selection phase to identify the best model for the study's data. First, the Fixed Effects Model (FEM) outperforms the Polled Ordinary Least Squares (POLS) model, as evidenced by the F-test result of 12.75, which was highly significant at the 1% level of significance. Second, the Random Effect Model (REM) is superior to the POLS model, as seen by the LM test result of 4542.30, which is once more highly significant at the 1% level of significance. Lastly, the Hausman test result was 59.86, demonstrating the superiority of the Fixed Effect Model (FEM) over the Random Effect Model (REM) and being highly significant at the 1% level of significance. To confirm the stability and reliability of the estimation results, this paper combined the outcomes of these tests and decided to use FEM as the primary analytical model for this investigation.

Table 2 Model Selection

Test	Chi²	Result
F test	12.75***	FEM outperforms POLS
LM test	4542.30***	REM outperforms POLS
Hausman test	59.86***	FEM outperforms REM

Note: $^{*}p<0.10$，$^{**}p<0.50$，$^{***}p<0.01$

Model Setting

$$ESG_{it} = \alpha_0 + \alpha_1 FSSM_{it} + \alpha_2 Controls_{it} + IndustryFE + FirmFE + YearFE + \varepsilon_{it} \quad (1)$$

$$M_{it} = \beta_0 + \beta_1 FSSM_{it} + \beta_2 Controls_{it} + IndustryFE + FirmFE + YearFE + \varepsilon_{it} \quad (2)$$

$$ESG_{it} = \gamma_0 + \gamma_1 FSSM_{it} + \gamma_2 M_{it} + \gamma_3 Controls_{it} + IndustryFE + FirmFE + YearFE + \varepsilon_{it} \quad (3)$$

Where model (1) is the main regression model to investigate the establishment of the financial shared service centre of enterprise i in year t. Model (2) mediates the effects models denotes the corporate ESG performance of enterprise i in year t. And model (3) is the ensemble of control variables.

4. Empirical results

Descriptive statistics

Table 3 represents the descriptive results. In the descriptive statistics results of this paper, several variables exhibit significant practical significance and theoretical value. First, the distributional characteristics of ESG performance (mean 4.339, standard deviation 0.965) reflect the differentiated practices of the sample firms in the environmental, social and governance dimensions, with a mean close to the median (about 4.25) indicating that most of the firms have incorporated the concept of sustainability into their strategic frameworks, but the standard deviation reveals significant heterogeneity of ESG practices across industries, which is in line with the trend of increasing sensitivity to ESG in the global capital market. Ratings sensitivity increases, which coincides with the trend of increasing sensitivity of global capital markets to ESG. In contradiction of the mean value of 1.771 of Tobin's Q-value, which represents the market's optimistic expectations of firms' future growth, the low mean value of 0.048 and high dispersion (maximum value of 0.174) of return on total assets (ROA) indicate a significant divergence in the profitability of the sample firms. An empirical starting point for evaluating the resource reallocation efficiency of financial shared services is this discrepancy between short-term profitability and long-term value creation. Furthermore, the industry differences arising from the low mean value of 0.071 for the current ratio and the mean value of 0.230 for the fixed asset ratio together outline the real dilemma of the capital structure transformation of Chinese firms, i.e., the liquidity constraints they face in the pursuit of asset-lightening.

The sample firms are still in the early stages of the governance modernisation process, as indicated by the low prevalence of non-Big Four audits and the mean values of two positions, which are 0.151 and 0.206, respectively, in terms of governance structure. On the other hand, the constant distribution of the mean value of the proportion of independent directors, which is 0.377, indicates that regulatory regulations have a favourable effect on increasing board independence. By maximising information openness, this set of governance traits offers a distinctive institutional framework for investigating the ways in which financial shared services impact corporate governance effectiveness.

Table 3 Descriptive statistics

VarName	Obs	Mean	SD	Min	Max
ESG	4785	4.339	0.965	1.750	6.750
FSSM	4785	0.457	0.498	0.000	1.000
Size	4785	23.222	1.528	20.252	27.547
ROA	4785	0.048	0.036	0.002	0.174
GrossProfit	4785	0.270	0.169	-0.014	0.802
TobinQ	4785	1.771	1.116	0.791	7.056
Mfee	4785	0.073	0.056	0.006	0.330
Fixed	4785	0.230	0.178	0.003	0.719
CashFlow	4785	0.071	0.046	0.002	0.230
FirmAge	4785	3.034	0.319	2.079	3.689
Big4	4785	0.151	0.358	0.000	1.000
Dual	4785	0.206	0.404	0.000	1.000
Indep	4785	0.377	0.057	0.333	0.600

Correlation analysis

The findings of the correlation study are shown in Table 4. The result of correlation test is mainly reflected in two aspects: one, by observing the initial relationship between the variables, it provides a theoretical basis for the subsequent empirical analysis; and two, by detecting the correlation between the variables, it avoids the interference of the multiple covariance problem on the results of regression analysis. In particular, there is a strong positive correlation between the establishment of financial shared service centres by businesses and ESG performance, as indicated by the correlation coefficient between ESG performance and financial shared service centres (FSSM) of 0.135, which is positively significant at the 1% level of significance. In addition, the correlation coefficient between ESG performance and management expenses (Mfee) is -0.126, which is adversely significant at the 1% level, demonstrating that the reduction of management expenses helps to boost the ESG performance of organisations.

Larger organisations are more likely to adopt Financial Shared Service Centres (FSSCs), as evidenced by the correlation coefficient between FSSM and firm size (Size) of 0.144, which is favourably significant at the 1% level of significant when considering the correlation of other factors. The correlation coefficient between ESG performance and Return on Assets (ROA) is 0.122, positively significant at 1% level of significance, and the correlation coefficient between ESG performance and SalesGrowth Rate (GrossProfit) with a correlation coefficient of 0.123, positively significant at the 1% level of significance, suggesting that there is a synergistic effect

between firms' profitability and sustainability. However, the correlation coefficient between ESG performance and Tobin's Q (TobinQ) is only 0.036, which is positively significant at the 5% level, but the correlation is weak, which may imply that the capital market has limited sensitivity to firms' long-term value creation.

In terms of governance structure, the correlation coefficient between ESG performance and the proportion of independent directors (Indep) is 0.124, which is positively significant at the 1% level of significaance, and the correlation coefficient between ESG performance and whether or not the Big Four audits (Big4) is 0.210, which is positively significant at the 1% level of significance, which suggests that high-quality governance mechanisms have a positive impact on enhancing the sustainable development of enterprises. In comparison, the correlation coefficient between ESG performance and having two occupations (Dual) is only 0.001, which is not significant at the 1% level of significance, showing that concentration of power may have a more limited impact on CSR practices.

Table 4 Correlation analysis

	ESG	FSSM	Size	ROA	GrossProfit	TobinQ	Mfee
ESG	1						
FSSM	0.135***	1					
Size	0.285***	0.144***	1				
ROA	0.122***	0.033**	-0.107***	1			
GrossProfit	0.123***	0.022	-0.157***	0.404***	1		
TobinQ	0.036**	0.000	-0.360***	0.352***	0.289***	1	
Mfee	-0.126***	-0.078***	0.369***	-0.038***	0.407***	0.257***	1
Fixed	-0.085***	-0.065***	0.093***	-0.070***	-0.133***	-0.107***	-0.052***
CashFlow	0.072***	0.044***	0.0200	0.470***	0.222***	0.186***	-0.084***
FirmAge	-0.0180	0.236***	0.090***	-0.024*	-0.054***	-0.074***	-0.106***
Big4	0.210***	0.082***	0.447***	-0.014	0.052***	-0.112***	-0.085***
Dual	0.001	0.062***	-0.142***	0.066***	0.067***	0.107***	0.050***
Indep	0.124***	0.058***	0.146***	-0.028*	-0.028*	0.017	-0.019

	Fixed	CashFlow	FirmAge	Big4	Dual	Indep
Fixed	1					
CashFlow	0.241***	1				
FirmAge	0.018	0.008	1			
Big4	-0.004	0.084***	-0.063***	1		
Dual	-0.078***	0.020	-0.071***	-0.056***	1	
Indep	-0.033**	0.008	-0.086***	0.091***	0.092***	1

Note: $^{*}p<0.10$，$^{**}p<0.50$，$^{***}p<0.01$

Multicollinearity test

Table 5 presents the variance inflation factor (VIF) of each variable. The VIF values of all variables are lower than 5, which implies that there is no major multicollinearity concern in this study. All of the VIF values are considerably below the generally used thresholds of multiple covariance (typically 10), which suggests that there is a good degree of independence among the variablesthat can be utilised for regression analysis. In addition, the 1/VIF values for each variable are all higher than 0.1, further proving the low covariance between the variables [58].

Table 5 Multiple covariance test

Variable	VIF	1/VIF
ROA	1.680	0.597
Size	1.670	0.599
GrossProfit	1.580	0.631
Mfee	1.520	0.657
CashFlow	1.470	0.679
TobinQ	1.370	0.729
Big4	1.310	0.765
Fixed	1.160	0.860
FSSM	1.110	0.905
FirmAge	1.100	0.906
Indep	1.060	0.946
Dual	1.050	0.950
Mean	VIF	1.340

Regression analysis

Table 6 presents the finding of regression analysis. By introducing control variables gradually and using a fixed effects model (1) with only fixed firm and year effects, the impact of the financial shared service centre (FSSM) on corporate ESG performance is thoroughly examined. The results show that the establishment of the FSSM significantly improves firms' ESG performance, with a coefficient of 0.129 on ESG performance that is positively significant at the 1% level. The coefficient of FSSM on ESG performance in model (2), following further control variable introduction, is 0.113, remaining positive and significant at the 1% level. This suggests

that the creation of financial shared service centres continues to significantly improve businesses' ESG performance even after adjusting for other variables. Specifically, among the control variables, the firm size (Size) coefficient is 0.119, which is positively significant at the 1% level, meaning that the larger the firm size, the better the ESG performance; the return on total assets (ROA) coefficient is -0.832, which is negatively significant at the 10% level, meaning that the ESG performance of more profitable firms is relatively weak; and the sales growth rate (GrossProfit) coefficient is 0.524, which is positively significant at the 1% level, meaning that the enterprise's ESG performance improves with faster sales growth. At the 1% level, Tobin's Q (TobinQ) has a coefficient of 0.067, which is positively significant, indicating that the better the ESG performance, the higher the market expects the enterprise's future growth; at the 1% level, the Management Expenses (Mfee) coefficient is -1.123, which is negatively significant, indicating that the better the ESG performance, the lower the overheads; and at the 5% level, the Fixed Asset Ratio (Fixed) has a coefficient of 0.306, which is positively significant at the 5% level, suggesting that the better the ESG performance. The model's R-squared value has now increased to 0.604, suggesting that the addition of control variables has improved the model's explanatory power even further. Similar to the first two models, model (3) further confirms the strong and favourable influence of financial shared service centres on corporate ESG performance. After further correcting for the industry effect, the coefficient of FSSM on ESG performance is 0.120, which is positively significant at the 1% level. At this stage, the model's R-squared value further improves to 0.609, suggesting that the model fit is further optimised with the addition of industry fixed effects. In conclusion, the regression analysis's findings show that the conception of financial shared service centres greatly improves businesses' ESG performance. This conclusion holds true even after adjusting for company, year, and industry factors, confirming hypothesis, therefore, **hypothesis H1 is supported.**

Table 6 Regression analysis

	Model (1)	**Model (2)**	**Model (3)**
	ESG	**ESG**	**ESG**
FSSM	0.129***	0.113***	0.120***
	(0.035)	(0.034)	(0.035)
Size		0.119***	0.107***
		(0.029)	(0.031)
ROA		-0.832*	-0.888*
		(0.486)	(0.487)
GrossProfit		0.524***	0.463***
		(0.151)	(0.153)
TobinQ		0.067***	0.065***
		(0.012)	(0.016)
Mfee		-1.123***	-1.315***
		(0.342)	(0.363)
Fixed		0.306**	0.261*
		(0.152)	(0.158)
CashFlow		-0.302	-0.297
		(0.298)	(0.302)
FirmAge		-0.072	-0.079
		(0.236)	(0.244)
Big4		-0.033	-0.058
		(0.076)	(0.078)
Dual		0.050	0.051
		(0.038)	(0.039)
Indep		0.627*	0.630**
		(0.321)	(0.320)
Industry FE	NO	NO	YES
Year FE	YES	YES	YES
Firm FE	YES	YES	YES
Constant	4.280***	1.324	1.659
	(0.018)	(1.004)	(1.050)
N	4785	4785	4785
R^2	0.597	0.604	0.609

Standard errors in parentheses，* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Regulatory effects of enterprise digitalisation

In today's digital era, enterprise digital transformation is not only a key factor in enhancing enterprise competitiveness, but also an important driver for sustainable development. By introducing the Digital Transformation Index (DIG) as a moderating variable, we can explore in depth how digital transformation interacts with the Financial Shared Service Centre (FSSM), which in turn affects the ESG performance of the firms.

This paper uses the digital transformation index (DIG), which was developed using word frequency data, to gauge the extent of an organization's digital transformation, according to [59] research methodology. The index fully reflects how businesses are implementing digital technology, digital management, and digital strategy by assessing the frequency of terms connected to digitisation in their annual reports.

Both model (4) and model (5) in table 7 demonstrate that the interaction term (DIG_FSSM) of the financial shared service centre (FSSM) and the corporate digital transformation index (DIG) on ESG performance has coefficients of 0.002 and 0.003, respectively, in the moderated effects analysis. These coefficients are both positively significant at the 1% level. This result indicates that digital transformation of firms significantly enhances the positive impact of financial shared service centres on firms' ESG performance. Specifically, digital transformation improves the enterprise's information processing capability and decision-making efficiency, which makes the resource allocation optimisation and process standardisation of the financial shared service centre more effective, and thus promotes the sustainable development of the enterprise more effectively. Therefore, **hypothesis H2 is supported.**

Table 7 Moderating effects of enterprise digital transformation

	Model (4)	**Model (5)**
	ESG	**ESG**
FSSM	0.070**	0.074**
	(0.036)	(0.036)
DIG	0.032**	0.029*
	(0.016)	(0.016)
DIG_FSSM	0.003***	0.002***
	(0.001)	(0.001)
Size		0.086***
		(0.031)
ROA		-0.706
		(0.486)
GrossProfit		0.480***
		(0.153)
TobinQ		0.051***
		(0.015)
Mfee		-1.156***
		(0.367)
Fixed		0.201
		(0.158)
CashFlow		-0.307
		(0.300)
FirmAge		-0.120
		(0.243)
Big4		-0.057
		(0.078)
Dual		0.053
		(0.039)
Indep		0.607*
		(0.320)
Year FE	YES	YES
Firm FE	YES	YES
Industry FE	YES	YES
Constant	4.217***	2.233**
	(0.033)	(1.049)
N	4785	4785
R^2	0.607	0.612

Standard errors in parentheses，* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Regional differences

The sample is split geographically into three regions—western, central, and eastern—for heterogeneity analysis to account for regional variations. The substantial variations among areas in terms of their degree of economic growth, policy environment, market maturity, and resource distribution serve as the foundation for this classification. The central region has grown quickly in recent years under the coordinated regional development strategy, the western region has persisted in promoting infrastructure development and industrial upgrading with policy support, and the eastern region typically has a higher level of economic development and market maturity. These variations could result in notable variations in the impact on ESG performance and the efficiency with which businesses deploy financial shared service centres across various geographies.

According to table 8, the coefficient of FSSM on ESG performance is 0.110 for the western region, which falls short of the significant level; 0.107 for the central region, which is positively significant at the 5% level; and 0.152 for the eastern region, which is positively significant at the 10% level. The financial shared service centres have a greater impact on the ESG performance of businesses in the central and eastern areas, with the eastern region seeing the largest contribution.

Businesses in the eastern region can more easily access advanced technology and management experience, as stronger policy support, which allows them to better allocate resources and increase management efficiency when implementing financial shared service centres. The eastern region also typically have more developed market environments and higher levels of economic development. In addition to increasing operational effectiveness, this kind of optimisation helps businesses allocate more funds to corporate governance, social responsibility, and environmental preservation, which boosts their ESG performance considerably. The central region has seen substantial infrastructural improvement and economic development in recent years, driven by the national coordinated regional development strategy. By establishing financial shared service centres, enterprises can better adapt to market changes and improve their internal management, which will in turn promote the improvement of their ESG performance. In contrast, although the western region has continued to promote infrastructure construction and industrial upgrading with policy support, the overall economic foundation is relatively weak, and the market environment and resource allocation constraints make it more challenging for enterprises to implement financial shared service centres, so their contribution to ESG performance is relatively small. Therefore, **hypotheses H3 and H4 are supported.**

Table 8 Heterogeneity: regional differences

	Model (6)	Model (7)	Model (8)
	Western region	Eastern region	Central region
	ESG	ESG	ESG
FSSM	0.110	0.152*	0.107**
	(0.090)	(0.081)	(0.043)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Firm FE	YES	YES	YES
Industry FE	YES	YES	YES
Constant	4.653	2.781	0.106
	(3.064)	(2.234)	(1.319)
N	766	885	3115
R^2	0.585	0.610	0.617

Standard errors in parentheses，* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5. Conclusions and recommendations

Conclusion

This paper systematically explores the impact of financial shared service centers (FSSM) on corporate environmental, social and governance (ESG) performance and its mechanism of action using data from listed companies from 2013 to 2023. To ensure the robustness of the findings, the paper employs various methods such as instrumental variables approach, fixed effects modeling, and propensity score matching (PSM) to address potential endogeneity issues. The main findings are as follows: first, the research results show that with the establishment and improvement of corporate financial shared service centers, the ESG performance of corporations shows a significant upward trend. This finding still holds robustly even after adjusting for endogeneity issues and changing the measure of core variables. This suggests that financial shared service centers, as an innovative management practice, play an important role in promoting enterprises to achieve sustainable development goals. Second, the mechanism analysis reveals that financial shared service centers improve firms' environmental (E), social (S), and corporate governance (G) performance through three critical paths-environmental protection, employment promotion, and internal control optimization, respectively. Specifically, financial shared service centers promote green innovation and environmental protection by optimizing resource allocation and enhancing operational efficiency; enhance corporate social responsibility

performance by increasing employment opportunities and improving employee welfare; and optimize corporate governance structure by strengthening internal control and risk management. Third, the moderating effect study shows that corporate digital transformation plays a significant positive moderating role in the relationship between financial shared service centers and ESG performance. The higher the degree of digital transformation, the more obvious the effect of financial shared service center on ESG performance. Fourth, the heterogeneity analysis finds that the effect of financial shared service centers on ESG performance varies significantly across firms with different characteristics. Specifically, the enhancement effect of financial shared service centers on ESG performance is more significant for firms facing high financing constraints, state-owned enterprises, and firms located in the east-central region. This may be related to the differences in access to resources, policy support and market environment of these enterprises.

Policy Recommendations

1. Promote the construction of financial shared service centers

First, provide tax incentives and financial subsidies to reduce the economic burden of enterprises in the initial construction and operation. For example, provide a certain percentage of tax relief to enterprises that establish financial shared service centers, or set up a special subsidy fund to support process optimization and technological upgrading. Second, strengthen policy propaganda and guidance to raise enterprises' awareness of the long-term value of financial shared service centers. Through the organization of training and seminars, popularize the role of financial shared service centers in enhancing management efficiency, optimizing resource allocation and promoting sustainable development to corporate executives and management. Once again, promote the development of industry standards to ensure that the construction and operation of financial shared service centers are in line with the norms. The government can join hands with industry associations and experts to formulate unified industry standards and best practice guidelines to provide enterprises with a clear construction direction and reference basis. Finally, establish a policy evaluation and feedback mechanism to adjust and optimize incentive policies in a timely manner. By regularly collecting feedback and implementation effect data from enterprises, the implementation of the policy will be evaluated, and the content of the policy will be adjusted in a timely manner to ensure the effectiveness and adaptability of the policy.

2. Accelerate the process of enterprise digital transformation

First, increase investment in digital infrastructure construction to provide a favorable external environment for the digital transformation of enterprises. Accelerate the construction of

new infrastructure such as 5G networks and data centers, improve network coverage and service quality, and reduce the cost of digital transformation for enterprises. Second, set up a special support fund to support enterprises' digitalization investment projects. For small and medium-sized enterprises (SMEs) and enterprises in traditional industries, low-interest loans or financial subsidies will be provided to encourage their digital equipment acquisition, software development and digital talent training. Again, strengthen policy guidance and service support for digital transformation. Formulate a strategic plan for digital transformation, specify key development areas and objectives, and provide enterprises with a clear direction for development. At the same time, establish a digital transformation service platform to provide enterprises with one-stop services such as technical consulting, program design and talent training. Finally, promote cooperation among industries, universities and research institutes to accelerate the popularization and application of digital technology. Encourage enterprises to cooperate with universities and scientific research institutions to jointly carry out digital technology research and development and application demonstration projects, promote the transformation of scientific and technological achievements into actual productivity, and improve the digitalization level and innovation ability of enterprises.

3. Implementing development strategies tailored to local conditions

In response to differences in financing constraints, the government should formulate differentiated financial support policies. For enterprises with high financing constraints, the government can set up special funds, provide low-interest loans and financing guarantees to alleviate financial pressure, and support the establishment and optimization of financial shared service centers. At the same time, financial institutions should be guided to increase credit investment, lower loan thresholds and interest rates, and improve the availability of financing. For enterprises with low financing constraints, the government should encourage them to take advantage of their own strengths and explore the integration of financial shared service centers with digital transformation to enhance ESG performance. Depending on the nature of enterprise ownership, the government should adopt a categorized guidance strategy. For state-owned enterprises, it should promote them to focus on ESG performance enhancement when establishing financial shared service centers through policy guidance and performance assessment, such as incorporating ESG indicators into the assessment system to incentivize them to play an exemplary role. For non-state-owned enterprises, the government should support the establishment of financial shared service centers through tax incentives, financial subsidies and

the construction of public service platforms, and encourage them to explore a sustainable development model that suits them. In response to regional differences, the government should formulate a regional coordinated development strategy. For the eastern region, it should be encouraged to be at the forefront of the construction of financial shared service centers and explore models that are in line with the international advanced level. For the central region, increase policy support and resources to speed up construction and promotion. For the western region, strengthen infrastructure construction and talent cultivation, create favorable conditions, and promote the improvement of its ESG performance through industrial transfer and policy guidance.

Acknowledgments: This paper was financially supported by Mahasarakham Business School, Mahasarakham University, Thailand.

Conflicts of Interest: The authors declare that there are no conflicts of interest regarding the publication of this paper.

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